

they assigned to a hydroxide. Table I presents the results of several water adsorption studies where OH was assigned to an XPS peak which was found to be approximately an electron volt on the low binding energy side of the molecular multilayer of ice. It is interesting to note that the formation of a hydroxide at the surface of a metal during water adsorption is similar to the formation of an alkoxy during alcohol adsorption. Alkoxy have been observed by various techniques during alcohol adsorption studies on other single and polycrystalline samples.^{7,9-17} The binding energies of the alkoxy O(1s) were found to be slightly lower than for the molecular alcohol.^{7,9,10}

One final experiment was performed to study changes, if any, in the D₂O adsorption characteristics after predosing the rhenium sample with small amounts of oxygen. A 5 L dose of O₂ prior to D₂O exposures produced no measurable changes in the results reported above either for thermal desorption or XPS studies. Fisher and Gland⁵ investigating the interaction of water with Pt(111) found that oxygen-covered surfaces shifted the desorption temperature upward some 30 K.

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¹M. Alnot, B. Weber, J. J. Ehrhardt, and A. Cassuto, *Appl. Surf. Sci.* **2**, 578 (1979).

²N. H. Turner, R. J. Cotton, and J. S. Murday, *J. Vac. Sci. Technol.* **18**, 593 (1981).

³J. C. Fuggle, L. M. Watson, D. J. Fabian, and S. Affrossman, *Surf. Sci.* **49**, 61 (1975).

⁴S. B. Nornes and R. G. Meisenheimer, *Surf. Sci.* **88**, 191 (1979).

⁵G. B. Fisher and J. L. Gland, *Surf. Sci.* **94**, 446 (1980).

⁶B. E. Koel, G. Praline, H. I. Lee, J. M. White, and R. L. Hance, *J. Electron Spectrosc. Relat. Phenom.* **21**, 31 (1980).

⁷P. D. Schulze, D. L. Utley, and R. L. Hance, *Surf. Sci.* **102**, L9 (1981).

⁸R. Ducros, M. Alnot, J. J. Ehrhardt, M. Houslye, G. Piquard, and A. Cassuto, *Surf. Sci.* **94**, 154 (1980).

⁹M. Bowker and R. J. Madix, *Surf. Sci.* **95**, 190 (1980).

¹⁰M. Bowker and R. J. Madix, *Surf. Sci.* **116**, 549 (1982).

¹¹J. W. Rogers, Jr., R. L. Hance, and J. M. White, *Surf. Sci.* **100**, 388 (1980).

¹²B. A. Sexton, *Surf. Sci.* **88**, 299 (1979).

¹³F. L. Baudais, A. L. Borschke, J. D. Fedyk, and M. J. Dignam, *Surf. Sci.* **100**, 210 (1980).

¹⁴B. A. Sexton, *Surf. Sci.* **102**, 271 (1981).

¹⁵E. I. Ko and R. J. Madix, *Surf. Sci.* **112**, 373 (1981).

¹⁶J. W. Rogers, Jr., and J. M. White, *J. Vac. Sci. Technol.* **16**, 485 (1979).

¹⁷D. Al-Mawlawi and J. M. Saleh, *J. Chem. Soc. Faraday Trans. 1* **77**, 2977 (1981).

A UHV gasket removal tool

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This note describes a safe, effective tool for removing copper gaskets from ultrahigh vacuum flanges. Use of the tool practically reduces to zero the chance of damaging the flange sealing surface, because all motion of the tool is away from the flange face, and force is required for gasket removal. In addition, the pliers maintain a positive grip on the gasket, keeping it from dropping onto delicate parts of any apparatus attached to the flange.

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The tool was fabricated from a pair of miniature (130-mm-long) "Parrot-Nose," ignition pliers shown in Fig. 1. This type of pliers, with the jaw opening offset in angle from the handles, ensures that the operator's hand clears any fixture that may be attached to the vacuum side of the flange. An additional advantageous feature is the adjustable jaw-opening pivot which allows the use of one tool for all gasket sizes. The pliers were roughed out as much as possible on a grinding wheel, and then lightly dressed with a file to the dimensions shown in Fig. 1. One jaw of the pliers is formed into a chisel-pointed gripping edge, whereas the other jaw is cut away to form an anvil, and a fulcrum about which the tool

pivots in use. The anvil is formed such that the fulcrum remains close to the gasket, thereby reducing the force required for gasket removal. The total construction time amounted to about 15 min. None of the dimensions are critical.

Figure 2 shows the tool positioned for gasket removal. The operator grasps the gasket such that the small, chisel-pointed gripping edge of the tool is inserted under the inside edge of the gasket, with the anvil end on the gasket o.d. In cases where the flange has not been relieved such that the under edge of the gasket is accessible, the tool bites into the inner wall of the gasket. The tool is then rotated away from

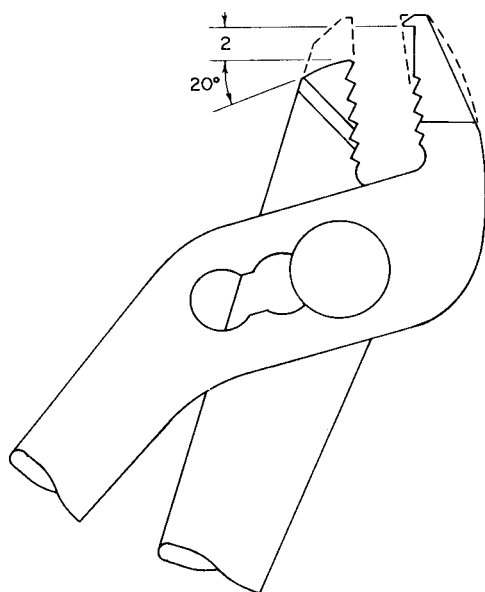
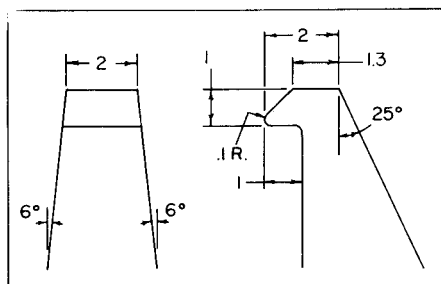


FIG 1. Scale drawing of the gasket removal tool. Commercial "Parrot-Nose," ignition pliers were modified to the dimensions shown. Dashed lines show the original outlines of the pliers' jaws. Insert at top is an enlarged drawing of the chisel-pointed, gripping edge. Lengths are in mm.

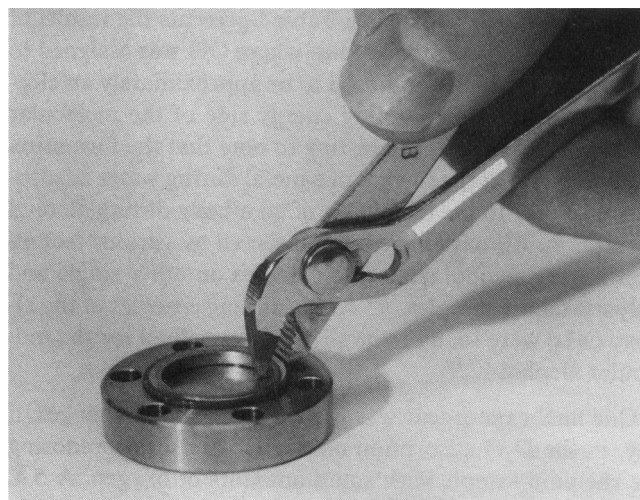


FIG 2. Tool positioned for removal of Miniconflat gasket.

the center line of the flange, using the anvil as a pivot, thereby lifting the inner edge of the gasket. This pivoting action serves to distort the gasket and aids in breaking the gasket free of the flange with the expenditure of very little exertion.

The present tool, so far, has proven sufficient for all our needs, especially for Miniconflat flanges for which, because of their small size, the gaskets are particularly adherent. Those rare instances, in which there may be insufficient clearance (say, less than 3 mm) to allow access to the wall of the gasket i.d. detract from the general utility of the tool. It may then be necessary to utilize a tool which exerts force on the gasket o.d.¹

¹E. E. Chaban, *J. Vac. Sci. Technol.* **12**, 654 (1975).